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(54) Title: TOXICANT-FREE RODENT EXTERMINATOR

(57) Abstract

A toxicant-free composition for exterminating rodents, such as rats and mice, comprises pellets of either crushed and dried corncobs, or, spent grain bound together with an attractant, such as molasses.

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TOXICANT-FREE RODENT EXTERMINATOR

Cross-Reference to Related Application

This application is a continuation-in-part of Application Serial No. 08/500,613 filed July 11, 1995 for "Toxicant-Free Rodent Exterminator".

Background of the Invention

Many products are available for controlling rodents, such as rats and mice, and insects, such as ants. Such products usually employ an inert substance combined with a rodenticide. However, products with a toxicant may only be used in carefully selected areas to avoid contaminating food supplies, water supplies, domestic animals and people. Further, products using a rodenticide are undesirable because an animal, bird, or reptile feeding on a poisoned rat or mouse may also die from the toxic product. Examples of such prior art products can be found in the following United States Patent Nos.: 1,952,977 which was issued March 27, 1934 to J. Bernard Edmonds for "Method of Treating Red Squill for Use as a Rodent Exterminator"; 4,287,183 which was issued September 1, 1981 to John D. Hagerman and Brenda M. Hagerman for "Method for Killing Rodents"; 4,379,139 which was issued April 5, 1983 to Ray F. Dawson for "Anticoagulant Rodenticide With Laceration Means"; 4,518,580 which was issued May 21, 1985 to Nunzio R. Pasarela for "Expanded Corncob Grits Having Increased Absorptivity and a Method for the Preparation thereof"; 4,581,378 which was issued April 8, 1986 to Remus Lazar and Emil P. Lira for " Rodenticide Compositions Comprising an Artificial Sweetener and a Rodenticide"; 4,815,923 which was issued March 28, 1989 to Raymon W. Lush for "Sweet Corn Based Rodenticide"; 5,019,564 which was issued May 28, 1991 to H. Edward Lowe, Ricky L. Yoder and Clayton C. Nelson for "Non-Clay Agricultural Granule"; 5,132,321 which was issued July 21, 1992 to Garland G. Corey for "Anticoagulant/Surfactant Rodenticidal Compositions and Method"; and 5,290,556

which was issued March 1, 1994 to Gerald H. McKibben, Joseph C. Dickens and James W. Smith for "Plastic Bait Composition for Attracting and Killing Crop Pests".

Some non-toxic bait compositions have been disclosed in the prior art. These include United States Patent No. 5,186,935 which was issued February 16, 1993 to John W. Tucker for "Insecticidal Bait Composition and Method of Making Same".

Summary of the Invention

The broad purpose of the present invention is to provide a toxicant-free composition that can be used for controlling rodents, such as rats and mice. The preferred embodiment of the invention comprises pellets preferably formed of crushed spent grain such as corncobs, and a rodent attractant such as molasses, which also functions as a binder.

Another object of the invention is to provide a toxicant-free product for controlling insects, such as ants, in the form of pulverized or ground-up spent grain such as corncobs which are dried and sprinkled in the area where the ants are present.

Some advantages of the invention is that the product can be safely used indoors, outdoors, in the home, around food and in the fields. It can be applied by air planes, helicopters, and other forms of vehicles.

In one form of the invention, the material will not dissolve in water. The product can be dispensed by hand without fear of toxic chemical exposure. It is completely non-toxic to other animals, such as birds, cats, dogs, or reptiles that might eat a rat or mouse killed by the product. The product will not contaminate a drinking water supply, will not harm fish, birds or wild life, will not cause any harmful effects if swallowed or absorbed through the skin, will not harm children or pets, and can be safely eaten by domestic animals and livestock.

The unique characteristic of the inventive product is that when eaten by rats and

mice, it accomplishes the same objective as products classified as a rodenticide. It has been safely tested on numerous types of rats and mice with equal degrees of success. The product over a period of time, causes rats and mice to fall asleep as they become gradually undernourished.

In the preferred form of the invention, the product is applied as a pellet. Tests indicate that the product is selective because it is not harmful to animals, other than rats and mice.

Other grains such as oats, barley, rye, soybean, millet, rice, wheat and sorghum, but not limited to these, either individually or in combination produce the same effect on mice and rats when the criteria for particle size and moisture content are followed.

The grain is milled to separate the floury endosperm from the bran and germ. The milled grain is then rolled to extract the oil from the germ. The remaining product is a non-nutritional by-product known in the industry as "spent grain."

The spent grain is then passed through a drying process and aerated to achieve a moisture content ranging from 7%-9%. Another rolling and aeration process using double rollers removes any remaining colloidal minerals to produce an all natural cellulose.

The cellulose in a workable size particle is then mixed with the attractant and binding substance and pelletized to 1/4 to 3/8 inch in length.

The product is dried to a moisture level of preferably 7%-9%, which causes the product to absorb the moisture from any existing food in the gut of the rodent.

The attractant is selected according to what is readily available and what the rodents are accustomed to eating. It may range from molasses, beer, blood, shrimp, nuts, fish, beets, dry or liquid.

The pellets may be used in both urban and rural settings, around buildings,

including homes, in agricultural settings, such as barns, grain bins, and animal quarters.

Description of the Preferred Embodiment

The preferred composition is produced by preparing a substantially dry base of a cellulose in the form of spent grain such as crushed corncobs, without kernels, and 1% by weight of molasses as a rodent attractant and binder. The kernels are first removed from the corncobs in a mill. The core of the corncobs is then drilled to recover a powder used for other purposes. The remaining rings are crushed to a U.S. sieve size of 20-40 so as to be easily ingested by the rodent.

The crushed corncobs are dried to a 7%-9% level of moisture, by weight. The dried particles are then mixed with molasses in a ribbon mixer. Some steam is applied to caramelize the molasses. The mixture is formed into pellets in a pelletizing mill, such as a Scott Pellet Mill. The molasses acts both as a binder and a sweet attractant. Preferably, the pellets are about 3/15" in diameter and typically 1/2" long.

The pellets are distributed in locations where the rats or mice are active. Over a period of several days, the rats and mice die after consuming the pellets.

When the corncobs are crushed in a finer powder-like form with or without an attractant, the powder can be distributed in the vicinity where ants are present. Tests indicate that the dried cellulose powder, without the attractant, is effective on such ants as carpenter ants, fire ants and termites. The material is spread around the ant hill so as to be in the ants path. The ants die upon ingesting the powder. The material used for rodents can be formed into shapes, other than pellets. Further, other sweets and attractants can be used, such as honey, chocolate, blood plasma, peanut butter, fish, beer and other similar materials.

The pellets may be coated with a paraffin or other coating to protect the composition from contact with water.

The pellets are placed in areas where evidence of rodent activity exists. The pellets are replenished as needed until signs of rodent activity ceases. For example for Norway rats: use 2 oz. (57 grams) every 15-30 feet of runways/walls. The pellets may also be placed directly in the burrows. For house mice, use no more than 2 oz. (57 grams) per 20 feet of runways/walls areas. Feeding vertically in ceilings and walls where rodents may have nesting sites is recommended for serious mouse infestation. The following examples illustrate the use of the preferred embodiment of the invention.

EXAMPLE I

SUMMARY:

Five male and five female Sprague Dawley derived rats were fed test molasses pellets. All animals died by day 7. Clinical observations included dehydration, tremors, lethargy, soft light stool and weight loss.

PURPOSE:

To determine the effectiveness of the test material prepared according to the preferred embodiment, to produce death in the treated animals when administered as supplied, ad libitum for a period of 14 days.

MATERIAL AND METHODS:

TEST ANIMALS:

Species: Rattus norvegicus

Strain: Sprague Dawley derived

Sex: Male and female (females nulliparous and non-pregnant)

Weight Range (at initiation): Male: 115-125 grams; Female: 115-125 grams

Number/Sex/Dose Level: 5 male, 5 female

Identification: Animals placed on test were identified with cage labels and ear punches.

Husbandry:

Diet: Standard laboratory feed for rodents; food and water were available ad libitum.

Housing: Animals were housed in suspended stainless steel wire-mesh cages in a room controlled for temperature (targeted at 21 degrees C +/- 1 degree).

Acclimation: Animals were acclimated to the testing facility at least 7 days prior to the start of testing. Animals were observed for general health and suitability for testing during this period.

Justification of Selection of Test System: The rat is the preferred species for acute oral toxicity testing because of an extensive historical data base.

Assignment to Dose Groups: Animals placed on test were randomly assigned to dose groups. Only rats with body weight within +/- 20% of the mean body weight of rats of the same age, strain, and sex were used.

Route of Administration: The test material was placed in 4 ounce, clear glass feeding jars for continuous ad libitum access to the food.

Frequency: Additional test material was added daily.

Test Duration: 7 days.

DOSING PROCEDURE:

Animal Preparation: The rats were randomly selected and weighed on day 0, ear punched and single housed in cages.

Sample Preparation: The test material was dosed as supplied.

Treatment: An equal quantity of the test material was given to each animal.

IN LIFE OBSERVATION:

Body Weight: Body weight was recorded in grams for each animal daily.

Signs of Toxicity and Mortality: All test animals were observed for signs of toxicity and mortality twice daily seven days a week after administration. Test animals were observed for a total of 7 days after dosing. Observations included the following: circulatory, autonomic and central nervous systems, somatomotor activity, behavior patterns, skin and fur, and eyes and mucous membranes.

Post-Mortem Observations: A gross necropsy was performed on all test animals.

RESULTS:

Mortality: All animals died by day 7. On day 4, one female was found dead. On day 5, two males and one female were found dead. On day 6, two males and two females were found dead. On day 7, one male and one female were found dead.

Observations: Clinical observations noted during the study included dehydration, lethargy, diarrhea, tremors, weight loss, hunching and soft stool.

Body Weight: All animals had a daily weight loss.

Gross Pathology: At necropsy, tissue in some animals were autolyzed. Gross observations noted an absence of adipose tissue on test animals.

DISCUSSION:

Five male and five female Sprague Dawley derived rats for each dose were fed the sample as supplied.

All animals exhibited a daily weight loss and appeared dehydrated, however, they were noted to continue eating the test material during the daylight hours.

CONCLUSION:

The test material, when administered as supplied causes death within 7 days to rats initially weighing between 115 to 125 grams.

EXAMPLE II

Toxicant-free pulverized corncobs prepared without the attractant and in a particulate form was distributed on ants which died upon ingesting the sample.

EXAMPLE III

Eight tests on other materials having 1-4 day duration were conducted using the following materials prepared and dried in the particulate size of the preferred embodiment and dried to a level of 7%-9% moisture by weight:

Testing 16 Rats and 16 Mice

Test No.	1	2	3	4	5	6	7	8	SPENT GRAIN
PERCENTAGE OF SPENT GRAIN IN EACH CELL	100%	10%		5%	25%	15%	20%		CORN
		5%	20%	10%		5%		40%	BARLEY
		5%	5%			30%		10%	MILLET
		10%	10%	10%			10%	20%	RYE
		10%	20%	5%	10%		40%		OATS
		10%	5%	10%	40%			5%	RICE
		5%	20%	40%				10%	SORGHUM
		40%	20%	5%	15%		30%	10%	WHEAT
		5%		15%	10%	50%		5%	SOYBEAN
	100%	100%	100%	100%	100%	100%	100%	100%	

All test animals died in 1-4 days. Attractants used included molasses, chocolate, blood plasma, beer, peanut butter and other similar materials.

Having described my invention I claim:

CLAIMS

1. A toxicant-free bait powder for insects, such as ants, consisting essentially spent grain reduced to a particulate form.

2. A method for killing rodents which comprises orally administering to the rodents an effective amount of a toxicant-free composition consisting essentially of cellulose in a particulate form, mixed with an attractant.

3. A method as defined in claim 2, in which the cellulose is spent grain.

4. A method as defined in claim 2, in which the cellulose is crushed corncobs.

5. A method as defined in claim 2, in which the cellulose is dried to a moisture content not exceeding 10% by weight.

6. A toxicant-free rodent exterminating bait for oral consumption by a rodent consisting essentially of:

particulate toxicant-free cellulose particles, mixed with a rodent attractant.

7. A bait as defined in claim 4, in which the cellulose particles are bound together with the attractant in an extruded form such as a pellet.

8. A bait as defined in claim 4, in which the cellulose particles are dried to a moisture content of no more than 10%.

9. A bait as defined in claim 4, in which the cellulose comprises about 99% of the bait.

10. A bait as defined in claim 4 in which the cellulose is crushed to a size that can be ingested by the rodent.

11. A bait as defined in claim 4, in which the cellulose comprises a mixture ranging from 0-100% of the following spent grains: corncobs, oats, barley, rye, soybeans, millet, rice, wheat and sorghum, and the mixture is dried to a maximum moisture content not exceeding 10%.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/11453

A. CLASSIFICATION OF SUBJECT MATTER
IPC(6) :A01N 25/12
US CL :424/84, 403, 409, 405, 408, 439; 514/951
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 424/84, 403, 409, 405, 408, 439; 514/951

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
NONE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,019,564 A (LOWE ET AL.) 28 May 1991, see entire document.	1-11

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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